

WHAT IS CLAIMED IS:

1. A method for removing an agent from a physiological efferent fluid collection site, said method comprising:

5 introducing a non-occlusive aspiration element to a target site at least proximal to said physiological efferent fluid collection site; and

activating said aspiration element when said agent is at least predicted to be present in said target site to selectively remove said agent from said physiological efferent fluid collection site.

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2. The method according to Claim 1, wherein said physiological efferent fluid collection site is a vascular fluid collection site.

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3. The method according to claim 2, wherein said vascular fluid collection site is a cardiovascular fluid collection site.

4. The method according to Claim 3, wherein said cardiovascular fluid collection site is a coronary cardiovascular fluid collection site.

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5. The method according to Claim 4, wherein said coronary cardiovascular fluid collection site is a coronary sinus.

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6. The method according to Claim 1, wherein said physiological efferent fluid collection site is present in a mammal.

7. The method according to Claim 6, wherein said mammal is a human.

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8. The method according to Claim 1, wherein said agent is a therapeutic agent.

9. The method according to Claim 1, wherein said agent is a diagnostic

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agent.

10. The method according to Claim 9, wherein said diagnostic agent is a contrast agent.

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11. A method for selectively removing an agent from a cardiovascular efferent fluid collection site of a mammal, said method comprising:  
introducing a non-occlusive aspiration element to said cardiovascular efferent fluid collection site; and

10 selectively activating said aspiration element when said agent is at least predicted to be present in said efferent fluid collection site to selectively remove said agent from said efferent fluid collection site.

12. The method according to Claim 11, wherein said cardiovascular efferent  
15 fluid collection site is a coronary sinus.

13. The method according to Claim 11, wherein said agent is a therapeutic agent.

20 14. The method according to Claim 11, wherein said agent is a diagnostic agent.

15. The method according to Claim 14, wherein said diagnostic agent is a contrast agent.

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16. The method according to Claim 11, wherein said selectively activating comprises detecting said agent at said site and actuating said aspiration element in response thereto.

30 17. The method according to Claim 16, wherein said aspiration element is a catheter device.

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18. The method according to Claim 17, wherein said catheter device is introduced percutaneously to said site.

5 19. The method according to Claim 11, wherein said mammal is a human.

20. A method for removing a contrast agent from a coronary sinus of a mammal, said method comprising:

10 percutaneously introducing a non-occlusive aspiration element to said coronary sinus;

at least predicting the presence of said contrast agent in said coronary sinus to determine a fluid removal period; and

15 selectively activating said aspiration element during said fluid removal period to selectively remove said contrast agent from said efferent fluid collection site.

21. The method according to Claim 20, wherein said mammal is a human.

20 22. A system for selectively removing an agent from a physiological efferent fluid collection site, said system comprising:

(a) a non-occlusive aspiration lumen;

(b) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen;

25 (c) an actuation controller element for controlling actuation of said aspiration mechanism; and

(d) a detector for at least predicting the presence of said agent in said physiological efferent fluid collection site.

30 23. The system according to Claim 22, wherein said system further comprises a feedback element from said detector to said actuation controller element.

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24. The system according to Claim 23, wherein said actuation controller element selectively actuates in response to signals from said feedback element.

5 25. The system according to Claim 22, wherein said controller element is an adaptive controller element.

26. The system according to Claim 22, wherein said aspiration lumen is present in an elongated tubular structure.

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27. The system according to Claim 26, wherein said elongated tubular structure is a catheter device.

15 28. The system according to Claim 26, wherein said elongated tubular structure comprises an expandable distal end.

29. The system according to Claim 26, wherein said elongated tubular structure comprises a non-expandable distal end.

20 30. The system according to Claim 26, wherein said elongated tubular structure comprises a fenestrated distal end.

31. The system according to Claim 30, wherein said fenestrated distal end comprises sealable fenestrae.

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32. The system according to Claim 26, wherein said elongated tubular structure comprises an open distal end.

30 33. The system according to Claim 26, wherein said elongated tubular structure comprises a sealed distal end.

34. The system according to Claim 22, wherein said system further comprises an agent delivery element.

5 35. The system according to Claim 22, wherein said system further comprises a display element.

36. The system according to Claim 22, wherein said system further comprises a data recordation element.

10 37. The system according to Claim 22, wherein said detector is a minimally invasive detector.

38. The system according to Claim 37, wherein said detector is a fiber optic detector.

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39. The system according to Claim 22, wherein said detector is a non-invasive detector.

20 40. The system according to Claim 22, wherein said system further comprises a positioning and/or retaining element.

41. A system for selectively removing an agent from a physiological efferent fluid collection site, said system comprising:

- 25 (a) a non-occlusive aspiration lumen;
- (b) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen; and
- (c) an actuation controller element for controlling actuation of said aspiration mechanism.

30 42. A system for selectively removing an agent from a physiological efferent fluid collection site, said system comprising:

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- (a) a non-occlusive aspiration lumen;
- (b) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen; and
- (c) a detector for at least predicting the presence of said agent in said physiological efferent fluid collection site.

43. A device for selectively removing an agent from a physiological efferent fluid collection site, said device comprising:

- (a) a non-occlusive aspiration lumen present in an elongated tubular structure having a fenestrated distal end;
- (b) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen; and
- (c) an actuation controller element for controlling actuation of said aspiration element.

44. The device according to Claim 43, wherein said elongated tubular structure comprises an expandable distal end.

45. The device according to Claim 43, wherein said elongated tubular structure comprises a non-expandable distal end.

46. The device according to Claim 43, wherein said fenestrated distal end comprises sealable fenestrae.

47. The device according to Claim 43, wherein said fenestrated distal end comprises non-sealable fenestrae.

48. The device according to Claim 43, wherein said fenestrated distal end comprises both sealable and non-sealable fenestrae.

49. The device according to Claim 43, wherein said device further comprises

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a positioning and/or retaining element.

50. The device according to Claim 43, wherein said elongated tubular structure comprises an open distal end.

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51. The device according to Claim 43, wherein said elongated tubular structure comprises a sealed distal end.

52. The device according to Claim 43, wherein said device further comprises a detector for at least predicting the presence of said agent in said physiological efferent fluid collection site.

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53. A device for selectively removing an agent from a physiological efferent fluid collection site, said device comprising:

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(a) a non-occlusive aspiration lumen;

(b) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen;

(c) an actuation controller element for controlling actuation of said aspiration element; and

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(d) a detector for at least predicting the presence of said agent in said physiological efferent fluid collection site.

54. The device according to Claim 53, wherein said device further comprises a feedback element from said detector to said actuation controller element.

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55. The device according to Claim 53, wherein said actuation controller element selectively actuates in response to input from said feedback element.

56. The device according to Claim 53, wherein said aspiration lumen is present in an elongated tubular structure.

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57. The device according to Claim 56, wherein said elongated tubular structure is a catheter device.

58. The device according to Claim 56, wherein said elongated tubular structure comprises an expandable distal end.

59. The device according to Claim 56, wherein said elongated tubular structure comprises a non-expandable distal end.

60. The device according to Claim 56, wherein said elongated tubular structure comprises a fenestrated distal end.

61. The device according to Claim 60, wherein said fenestrated distal end comprises sealable fenestrae.

62. The device according to Claim 56, wherein said elongated tubular structure comprises an open distal end.

63. The device according to Claim 56, wherein said elongated tubular structure comprises a sealed distal end.

64. The device according to Claim 53, wherein said detector is a minimally invasive detector.

65. The device according to Claim 53, wherein said device further comprises a positioning and/or retaining element.

66. A kit for selectively removing an agent from a physiological efferent fluid collection site, said kit comprising:

(a) an aspiration element comprising:

(i) a non-occlusive aspiration lumen;

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- (ii) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen;
  - (iii) an actuation controller element for controlling actuation of said aspiration element; and
- 5 (b) instructions for practicing the method of Claim 1.

67. The kit according to Claim 66, wherein said kit further comprises a detector for detecting the presence of said agent in said physiological efferent fluid collection site.

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68. The kit according to Claim 67, wherein said detector is a minimally invasive detector.

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69. The kit according to Claim 67, wherein said detector is integrated with said device.

70. The kit according to Claim 67, wherein said detector is separate from said device.

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71. The kit according to Claim 66, wherein said aspiration lumen is present in an elongated tubular structure.

72. The kit according to Claim 71, wherein said device is a catheter device.

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73. A kit for selectively removing an agent from a physiological efferent fluid collection site, said kit comprising:

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- (a) an aspiration element comprising:
  - (i) a non-occlusive aspiration lumen; and
  - (ii) an aspiration mechanism operatively connected to said non-occlusive aspiration lumen; and
- (b) instructions for practicing the method of Claim 1.

74. The kit according to Claim 73, wherein said kit further comprises a detector for detecting the presence of said agent in said physiological efferent fluid collection site.

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75. The kit according to Claim 73, wherein said detector is a minimally invasive detector.

76. The kit according to Claim 73, wherein said detector is integrated with said device.

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77. The kit according to Claim 73, wherein said detector is separate from said device.

78. The kit according to Claim 73, wherein said aspiration lumen is present in an elongated tubular structure.

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79. The kit according to Claim 78, wherein said device is a catheter device.

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